Alewife

*Alosa pseudoharengus* (Wilson, 1811)  
syn. *Pomolobus pseudoharengus*

**Overview:**

Alewife is a ray-finned fish in the same Family as herrings, sardines, and shads. They are native to the East coast of North America, from Labrador down to South Carolina. It is an anadromous fish meaning that adults migrate upstream into freshwater for spawning, but spend most of their time in coastal waters. However, this fish can also complete its life cycle entirely in freshwater.

Historically the alewife was restricted from migrating Westward by Niagara Falls, but canal improvements allowed this species to bypass the Falls. In addition, climatic conditions and a collapse of the native piscivorous (fish-eating) fishes facilitated the spread of *A. pseudoharengus* into the Western Great Lakes in the mid 1900s. Cold winter water temperatures limit survival, but relatively warmer deep waters can provide refuge.

Water temperatures lower than 3°C severely stress the alewife as its lack of lipid-process adaptations causes osmoregulatory failures. This can be affected by diet; therefore, similar winters may have dissimilar mortalities.

Alewife form large schools and are sensitive to light. The alewife feeds primarily on zooplankton throughout its life cycle, focusing on the largest organisms. Adults will also feed on insects, and the eggs and larvae of other fish species, including their own at times. The females of land-locked populations can produce between 13,200 and 49,200 eggs, whereas oceanic females can produce up to 360,000 eggs. High populations of alewife cause detrimental impacts to zooplankton size, abundance, and community structure.

*A. pseudoharengus* have periodic mass mortalities where large numbers of dead fish will accumulate on shores and beaches. Any predatory fish utilizing alewife as a food source will suffer declines after these mass die-offs.

Alewife naturally contain high concentrations of the enzyme that breaks down thiamine. Consumption of alewife by other fish species causes thiamine deficiency, which lowers reproductive success. Females consuming alewife can produce thiamine-deficient eggs causing the young from these eggs to develop Early Mortality Syndrome (EMS), characterized by physical and behavior abnormalities as well as increased mortalities. It is possible that the disappearance of land-locked...
Alewife (continued)

salmon from Lake Ontario soon after
the alewife proliferated may be due to
this thiamin deficiency.1

A. pseudoharengus is similar in
appearance to the blueback herring
(Alosa aestivalis). The diameter of the
alewife’s eye is greater than the length
of the snout, whereas the blueback’s
eye diameter is equal to or less than
the length of the snout.1

As of January 1, 2016, the possession,
sale, or transport of this species in
Alberta is illegal under the Fisheries
Act.

Habitat:

In the ocean the alewife overwinters
in deep, offshore waters and then
migrates to shallower waters for
spawning.1 Inland populations will
occupy all strata of a lake over the
course of a year. They stay in open
water until spawning and then prefer
shores with rocky substrate. Warmer
waters are preferred.2

Identification:

The alewife is overall silvery in color
with a greyish-brown back. The body
is deep and strongly compressed
laterally. Scales are algae and
deciduous. The lateral line is not well
developed but adults have longitudinal
lines that run along the scales lines
above the midline. Scales along
the midline of the belly form scutes,
creating a distinctly serrated surface.1

There is a black spot behind the eye.
The upper jaw extends to below the
middle of the large eye. The front of the
lower jaw is thick and extends past the
upper jaw when the mouth is closed. A
few small teeth are present.1

A single dorsal fin with 13-14 soft rays
(sometimes 12-16) and the caudal tail
is forked. The anal fin is short, wide
and has 15-19 rays (usually 17-18). The
small pelvic fins have 10 rays. Pectoral fins have 16 rays (sometimes
14) and are low on the sides.1

In land-locked populations adult
alewife average total length is 125-175
mm. Anadromous, oceanic alewife
reach 360-380 mm.1

Ecology:

Inland populations spawn from April
to August in shallow waters.2 In Lake
Michigan spawning begins at water
temperatures over 15°C. The eggs are
broadcast at random and sink to the
bottom. Larvae from eggs hatched at
water temperatures less than 10.6°C
are deformed.1 Larvae are about
3.8mm, but reach 5.1mm by the time
the yolk sac is absorbed. Young
alewife prefer temperatures between
21 to 31°C.1 They must reach at least
60mm in length to survive winter.
Alewife feed by filtering, gulping, and
catching prey individually, and can
feed in the dark.1

Economic Impacts:

Alewife consumption of zooplankton
competes directly with native fish
for food.1 The consumption of other
species eggs and larvae negatively
impacts the populations of native
fishes.1 The decline of native sportfish
populations could have impacts on
recreation and tourism.

Environmental Impacts:

The high percentage of zooplankton
in the alewife’s diet disrupts
the abundance and structure
of zooplankton communities.1
Consumption of zooplankton competes
directly with native fish for food.
Consumption of other fish species’
eggs and larvae negatively impacts
native fish populations.1 Thiamin
deficiencies in native fishes, such as
tROUT or salmon, which consume alewife
can cause Early Mortality Syndrome
(EMS) in fry, negatively impacting their
overall populations.2

Sociological Impacts:

The accumulation of dead alewife from
mass die-offs creates foul odors and
sanitation issues.1 The transformation
of native aquatic communities results in
the intrinsic loss of natural capital and
enjoyment of natural areas.

Prevention:

Learn how to identify alewife and how
to prevent spread. Do not use alewife
as bait.1 Never empty your aquarium
into natural water bodies.

Control:

Once established alewife cannot
be eradicated. Populations can be
reduced by stocking alewife predator
species, such as brown trout (Salmo
trutta).2 Aggressive netting can be
used in areas where alewife are
vulnerable.2 If caught, alewife should
be killed and not released.
Alewife (continued)

![Alewife image](Shawn Good, Vermont Department of Fish and Wildlife, Bugwood.org)

REFERENCES:
